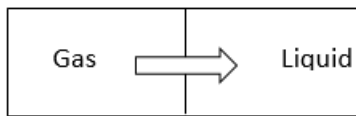


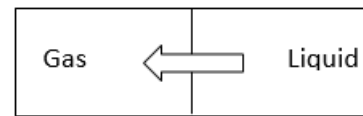
Gas absorption

Introduction:



Preferential dissolution of one or more components in liquid.

Absorption



Preferential mass transfer from liquid to gas

Desorption (stripping)

GAS LIQUID OPERATIONS

Features of Gas Liquid Operations

- Two carrier streams and at least one solute
- Matter is transferred across an interface
- Carrier phases are insoluble in each other
- Liquid carrier is non-volatile
- These operations are used for solute recovery or removal
- Rate of solute transfer is proportional to departure from equilibrium *Max transfer*

Choice of Solvents for absorption

The choice depends on the operation

- Production of a specific solution (HCl acid) \rightarrow Solvent is specified by Nature of production *در مرحله اول باید مشخص شود*
- Removal of a certain constituent \rightarrow choice is often possible (water is cheapest and most available) *اولی و کمترین*

1. Gas solubility: -

- High solubility is required \rightarrow increased rate of absorption.
- Good solubility is obtained if solute and solvent have similar chemical nature.
- In terms of mass fractions, the solubility is greater for low molecular weight solvents. Therefore, less solvent is required. (In terms of mole fraction solubility is independent).
- Chemical reaction of solvent with solute will result in very high solubility. Process must be reversible if solvent is to be reused.

H₂S is readily absorbed in ethanolamine at low temperatures and stripped at high temperatures.

2. Volatility

Solvent should have low vapor pressure at operating temperature in order to minimize losses of solvent. If necessary, a second less volatile liquid can be used to recover the evaporated amounts of the first.

3. Corrosiveness:

Material of construction for the equipment should not be expensive.

4. Cost

Solvent should be inexpensive → losses are not costly

5. Viscosity:

Low viscosity

- Rapid absorption rate
- Improved flooding conditions (higher throughput)
- Low cost of pumping
- Good heat transfer

يعمل على زيادة سرعة الامتصاص
يقلل من فقدان المذيب
يقلل من تكلفة الضخ
يحسن انتقال الحرارة

6. Other Factors:

Solvent should be:

- Non-toxic
- Non-flammable
- Chemically stable
- Have low freezing point

